"Selection vs. protection, composition vs. context: identifying the mechanisms of favorable *barrio* "effects" on Mexican-American health."

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ABSTRACT

Coethnic concentration/isolation/segregation are positively associated with Mexican-American health. This is puzzling because many Mexican-American communities are disadvantaged and as clustering is generally negatively associated with health in other disadvantaged communities. As such, it remains unclear whether positive barrio "effects" are an artifact of the composition of enclaves due to selective in- our out-migration, or if they are true proxies for advantages conferred by living close to coethnics. We assess selection vs. different forms of protection on Mexican American adult health from the 2005-2010 National Health and Nutrition Examination Survey merged with contextual data from the 2005-2009 American Community Survey (ACS). We will assess selection vs. protection using propensity score matching and other tests. We also use a more flexible, distance-buffer-based definition of residential environments. Preliminary results confirm the presence of a barrio "effect" on national data and points to a stronger signal among immigrants than the U.S.-born.

Racial/ethnic residential segregation, isolation, and concentration are associated with poor health for race/ethnic groups with overall low socioeconomic status (SES), such as non-Hispanic African Americans as well as Puerto Ricans (Lee and Ferraro 2007). In sharp contrast, Mexican Americans –who also have unfavorable SES– appear to represent one of likely few –if not the only– exception to this negative outlook: higher ethnic residential concentration, isolation, or segregation are associated with *better* health (Cagney, Browning and Wallace 2007; Eschbach, Mahnken and Goodwin 2005; Eschbach et al. 2004; Keegan et al. 2010; Kimbro 2009; Lee and Ferraro 2007; Ostir et al. 2003).

Neighborhood "effects" may be the reflection of two alternative mechanisms. First, residents of ethnic enclaves[1] could be compositionally different from coethnics living outside of these neighborhoods in unobserved characteristics associated with health, particularly when estimated with cross-sectional data (Oakes 2004; Sampson and Sharkey 2008; Sharkey and Faber 2014).[2] Alternatively, neighborhood "effects" could truly be a proxy for the ways in which context affects health, e.g., by exacerbating disadvantage and producing stress in the case of negative neighborhood "effects;" or by the positive effects of community life on reducing stress, modeling behavior, and promoting better access to care and health information in the opposite case.

Despite ample evidence of positive *barrio* "effects" on Mexican-American health (see references cited above), little work has uncovered whether the health advantage of people in the enclave is the result of composition (or selection), context (or protection), or both. Further, little

[1] We use the term enclave here to refer to finer-scale residential contexts with higher concentrations of Hispanics or Mexican Americans in particular, as opposed to the usage of the term in economic sociology and some immigration fields to denote an ethnic community bounded in a larger area (e.g., a larger portion of a city than a neighborhood) that has achieved a nontrivial amount of economic success and entrepreneurship.
[2] Note that self-selection could be present among individuals moving in and/or out of neighborhoods.

research has tried to uncover more specific protection mechanisms. Indeed, the *barrio* effects literature generally attributes the association of ethnic concentration and better health to context/protection, i.e., to the ability of enclaves to harness social, cultural, and human capital (Eschbach et al. 2004; Patel et al. 2003). These forms of capital may provide: a) social support to alleviate stress, b) social control against deleterious health behaviors, c) cultural practices that differentiate Mexican Americans from coethnics, and/or d) greater resource sharing within cohesive networks. With the exception of a study examining the role of collective efficacy in promoting better Mexican American health in Chicago neighborhoods (Cagney et al. 2007), little quantitative evidence thus far supports specific contextual mechanisms that support more specific protection hypotheses.

In this paper, we examine neighborhood "effects" on Mexican American adult health using data from the 2005-2010 cycles of the National Health and Nutrition Examination Survey (NHANES), a nationally-representative dataset (CDC/NCHS 2011) containing rich individual biomarker, anthropometric, and sociodemographic information. Using a restricted-access version of these data accessed at a research data center (as well as more limited version accessed remotely), we merged individual data from NHANES' residents of micro and metropolitan (i.e., CBSA) areas with contextual (i.e., census tract) data from the 2005-2009 American Community Survey (ACS). We examine several markers of cardiometabolic health, such as high blood pressure, cholesterol, and glycosylated hemoglobin, as well risk factors such as obesity and (retrospective) smoking.[3]

We build on prior work on *barrio* effects by assessing the extent to which the association between Latino concentration and health is likely due to self-selection into (or out of)

[3] We will also examine an index of cumulative biological risk (allostatic load) based on these indicators (Seeman et al. 2001).

neighborhoods. We use a diversity of strategies to test whether protection may be operating (net of selection) and whether it can be, for instance (mostly) explained by neighborhood-level social and cultural capital endowments (inasmuch as these can be measured using data derived from the American Community Survey). To identify protection from self-selection into and out of enclaves, we attempt to model the latter in a first step and use propensity score matching to assess if *barrio* "effects" remain robust to selection. In addition, we deploy a series of additional tests to assess whether selection or protection is a more likely mechanism for *barrio* "effects." First, we use health-related indicators that are fixed before moving into a neighborhood, such as height and –among the foreing-born– pre-migration smoking patterns, to indirectly assess whether selection into neighborhoods is at play.

Second, we examine *barrio* "effects" according to nativity. Given that Mexican immigrants are (at least mildly) positively selected in terms of health overall (Riosmena, Palloni and Wong 2013; Rubalcava et al. 2008) and that the so-called Hispanic Health Paradox is stronger among the foreign- relative to U.S.-born Hispanics (Markides and Eschbach 2005, 2011), selection into (and, perhaps, out of) neighborhoods is likely to be stronger among immigrants than among natives. As such, stronger positive *barrio* "effects" on health among the U.S.-born, as found by Lee and Ferraro (2007) using data from the Chicago Metro Area,[4] would likely signal a clearer role of protection relative to selection.[5] We test for these associations using a broader, nationally-representative sample that includes more traditional Mexican-American strongholds in the Southwest and Chicago (where all of the *barrio* effects work has taken place),

[4] Incidentally, this is the only study we found in which these associations are examined by nativity, so our work also contributes to documenting those differentials (and those according to other characteristics of immigrants, such as duration of stay and citizenship) further.

[5] This is, of course, unless Mexican Americans leaving the ethnic enclave (and identifying as Mexican-Americans in surveys) are quite negatively selected in terms of health, which we will attempt to identify as well.

as well as newer and re-emerging gateways elsewhere in the country. In addition, we test the strength of these associations according to immigrants' citizenship and duration of stay to assess if other forms of immigrant adaptation processes (e.g., negative acculturation as well as processes of cumulative disadvantage affecting immigrant communities in the long run, \Riosmena, In Press #2484} are at play.

Finally, after discarding or netting out the role of selection, we attempt to identify more specific forms of protection than those suggested by the use of Latino concentration measures. For this purpose, we create contextual typologies that incorporate not only neighborhood concentration, but also disadvantage and mobility to assess whether *barrio* effects are more likely in, e.g., indeed disadvantaged but stable neighborhoods, and if neighborhood measures indicating maintenance of cultural practices, such as national origin concentration, language diversity, family size, and multigenerational households explain part of the *barrio* "effect." For immigrant communities, we also include controls for the amount of experience and (achieved) access to citizenship at the neighborhood level.

We also propose additional methodological refinements to prior work on *barrio* "effects," which used census tracts as the basic spatial unit to measure residential environments. A recurring issue in neighborhood effects research is the definition and operationalization of a "neighborhood" or relevant geographic areas. Neighborhoods can be defined in many ways, but researchers agree that definition and scale of a neighborhood should be based on theory and evidence specific to the outcome(s) under study and the hypothesized pathways through which neighborhoods exert influence (Diez Roux 2004; Root 2012; Sharkey and Faber 2014). We examine the utility of a more flexible definition of neighborhood residential environment by estimating buffers of areas within 0.5, 1.0, and 2.0 km. from the sampled person's residence. The

use of radius-based neighborhoods should create more relevant spatial contexts and ameliorate the possibility of zoning biases created by the use administrative boundaries.

A closer examination of *barrio* "effects" like that proposed here will elucidate whether the Mexican American experience differs from that of other people of color because of higher levels of self-selection in and out of ethnic neighborhoods, particularly among immigrants, or because Mexican American residential contexts are protective of health despite economic disadvantage in arguably unique ways. In addition, understanding whether selection or protection, composition or context, explain positive *barrio* "effects" on health can greatly inform the mechanisms behind the Hispanic Health Paradox (HHP), the remarkable fact that Hispanics have higher life expectancies and –to some extent– better chronic health profiles and risk factors than would be expected given their low socioeconomic position in American society (Markides and Eschbach 2005, 2011).

Preliminary results

Table 1 shows results from analyses merely identifying the presence of a *barrio* "effect" among foreign- vs. U.S.-born individuals after controlling for relevant individual and contextual controls. We present models by nativity on three important markers of chronic health (high blood pressure, a proxy for hypertension; high cholesterol levels, an indicator of cardiovascular health; and high glycosylated hemoglobin, an indicator of poor diabetes control also used as a proxy for high insulin resistance).[6] We also present results for obesity, a major risk factor of the three aforementioned chronic health indicators. Finally, we present similar models predicting adult height as a falsification test for protection (i.e., a test for selection).

[6] Future versions of these analyses will include propensity score controls/weights as well as the contextual classification based on concentration/disadvantage/mobility as well as other measures of social/cultural capital discussed above.

-TABLE 1 ABOUT HERE-

Overall, these preliminary results show the existence of a positive association between Latino neighborhood concentration (or other measures related to the national origin or immigrant composition of the neighborhood) and health (i.e., a negative association with unfavorable health outcomes) in most of the outcomes under study (i.e., all for at least foreign- or U.S.-born Mexicans, except for high blood pressure, which is not statistically significant for either group). Further, these relationships are more likely to be statistically significant for the foreign- relative to the U.S.-born. While this could suggest selection is a more likely mechanism than protection given migrant self-selection and the larger immigrant influx into neighborhoods (upon their arrival into the U.S.), we cannot rule out that immigrants may experience stronger protection than natives because of the higher effectiveness of migrant social networks relative to those of natives (at least those embedded in residential environments). Further, even if true, this observation merely points to whether selection (particularly in immigration and immigrant destination and neighborhood choice) are a more likely explanation of the positive barrio effects, but does not discard protection (or other forms of selection, e.g., specific to the U.S.-born Mexican American community). We will continue work exploring all of these possibilities over the next few months.

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Table 1. Results from multilevel models (level 2 = CBSAs) predicting the likelihood of unfavorable chronic health outcomes (a-c), obesity (d), and height (e)

	a. High blood pressure (SBP > 120 or DBP > 90 mm Hg)			
	Foreign-born Mexicans		U.S.-born Mexicans	
	β	(S.E.)	β	(S.E.)
Male	0.034	(0.023)	0.009	(0.029)
Age	0.010	(0.001)	0.009	(0.001)
Age -squared				
Married	-0.016	(0.024) **	-0.038	(0.032) **
Formal schooling (years)	0.000	(0.003) **	-0.004	(0.004) **
Home owner	-0.016	(0.026) **	-0.049	(0.036) **
Employed	-0.078	(0.027) **	-0.026	(0.034) **
Family income (REF = Less than $10,000)				
$10,000 to $19,999	-0.086	(0.048) **	0.037	(0.074)
$20,000 to $34,999	-0.056	(0.049) **	0.102	(0.074)
$35,000 to $54,999	-0.061	(0.056) **	0.090	(0.082)
$55,000 to $74,999	-0.127	(0.069) **	0.145	(0.103)
$75,000 and over	-0.028	(0.083) **	0.218	(0.112)
Ratio of family income to poverty	-0.004	(0.018) **	-0.026	(0.021) **
Both English and Spanish spoken at home	0.051	(0.080)	-0.043	(0.032) **
Only Spanish spoken at home	-0.013	(0.083) **	-0.123	(0.089) **
Duration of stay (months)	-0.00006	(0.000) **		
Duration of stay - squared	-0.0000001	(0.000)		
Naturalized citizen	0.01706	(0.027)		
<u>Neighborhood characteristics:</u>				
Pct. Latino in buffer	0.00047	(0.001)	0.00018	(0.001)
Pct. Mexican descent | Latino	0.00040	(0.001)	-0.00166	(0.001) **
Pct. naturalized citizen | FB Mexican	0.002	(0.001)	-0.0005	(0.001) **
Pct 10+ years in U.S. | FB Mexican	0.000143	(0.001)	0.001299	(0.001)
Pct. speak Spanish at home | Latinos	0.0007	(0.001)	0.0008	(0.001)
Pct. of tract below federal poverty line	0.0017	(0.002)	0.0005	(0.002)
Intercept	-0.3631	0.1763 **	-0.0323	0.1999 **
Level 1 units				
Level 2 units	47		42	
AIC	948.3		767.9	
BIC	1007		817.8	

*** p<0.001 ** p<0.01 * p<0.05 † p<0.10

Table 1. Results from multilevel models (level 2 = CBSAs) predicting the likelihood of unfavorable chronic health outcomes (a-c), obesity (d), and height (e)

	b. High cholesterol			
	Foreign-born Mexicans		U.S.-born Mexicans	
	β	(S.E.)	β	(S.E.)
Male	0.037	(0.024)	-0.040	(0.027) **
Age	0.004	(0.001)	0.002	(0.001)
Age -squared				
Married	0.024	(0.025)	-0.017	(0.029) **
Formal schooling (years)	0.006	(0.003)	-0.002	(0.004) **
Home owner	-0.001	(0.027) **	-0.056	(0.034) **
Employed	-0.003	(0.028) **	0.041	(0.032)
Family income (REF = Less than $10,000)				
$10,000 to $19,999	0.018	(0.050)	0.048	(0.067)
$20,000 to $34,999	-0.015	(0.050) **	0.062	(0.068)
$35,000 to $54,999	-0.012	(0.057) **	0.078	(0.075)
$55,000 to $74,999	0.028	(0.071)	0.106	(0.094)
$75,000 and over	0.076	(0.086)	0.123	(0.101)
Ratio of family income to poverty	0.008	(0.019)	0.004	(0.019)
Both English and Spanish spoken at home	0.147	(0.087)	-0.005	(0.030) **
Only Spanish spoken at home	0.155	(0.089)	0.132	(0.080)
Duration of stay (months)	-0.00002	(0.000) **		
Duration of stay - squared	-0.0000003	(0.000)		
Naturalized citizen	-0.02610	(0.028) **		
<u>Neighborhood characteristics:</u>				
Pct. Latino in buffer	-0.00016	(0.001) **	0.00102	(0.001)
Pct. Mexican descent | Latino	-0.00012	(0.001) **	0.00013	(0.001)
Pct. naturalized citizen | FB Mexican	-0.002	(0.001) **	0.000	(0.001)
Pct 10+ years in U.S. | FB Mexican	0.001112	(0.000)	-0.001260	(0.001) **
Pct. speak Spanish at home | Latinos	-0.0055	(0.001) **	-0.0007	(0.001) **
Pct. of tract below federal poverty line	-0.0025	(0.002) **	0.0022	(0.002)
Intercept	0.2452	0.1741	-0.1128	0.1839 **
Level 1 units	1125		707	
Level 2 units	46		41	
AIC	1115.5		666.3	
BIC	1172.2		716.3	

*** p<0.001 ** p<0.01 * p<0.05 † p<0.10

Table 1. Results from multilevel models (level 2 = CBSAs) predicting the likelihood of unfavorable chronic health outcomes (a-c), obesity (d), and height (e)

	c. High glycosilated hemoglobin (> 6.7%)			
	Foreign-born Mexicans		U.S.-born Mexicans	
	β	(S.E.)	β	(S.E.)
Male	-0.004	(0.023) **	0.075	(0.028)
Age	0.006	(0.001)	0.006	(0.001)
Age -squared				
Married	-0.012	(0.023) **	-0.015	(0.030) **
Formal schooling (years)	0.000	(0.003) **	0.000	(0.004) **
Home owner	-0.060	(0.025) **	0.024	(0.034)
Employed	-0.019	(0.026) **	-0.032	(0.032) **
Family income (REF = Less than $10,000)				
$10,000 to $19,999	-0.007	(0.046) **	0.045	(0.069)
$20,000 to $34,999	-0.016	(0.047) **	0.141	(0.069)
$35,000 to $54,999	-0.033	(0.053) **	0.133	(0.077)
$55,000 to $74,999	-0.094	(0.067) **	0.093	(0.096)
$75,000 and over	-0.160	(0.081) **	0.191	(0.102)
Ratio of family income to poverty	0.048	(0.017)	-0.044	(0.019) **
Both English and Spanish spoken at home	-0.035	(0.082) **	0.032	(0.030)
Only Spanish spoken at home	-0.011	(0.084) **	-0.114	(0.083) **
Duration of stay (months)	0.00058	(0.000)		
Duration of stay - squared	-0.0000008	(0.000)		
Naturalized citizen	0.01521	(0.026)		
<u>Neighborhood characteristics:</u>				
Pct. Latino in buffer	-0.00123	(0.001) **	0.00049	(0.001)
Pct. Mexican descent | Latino	0.00067	(0.001)	-0.00137	(0.001) **
Pct. naturalized citizen | FB Mexican	-0.001	(0.001) **	-0.001	(0.001) **
Pct 10+ years in U.S. | FB Mexican	0.000005	(0.000) *	0.001409	(0.001)
Pct. speak Spanish at home | Latinos	0.0012	(0.001)	0.0005	(0.001)
Pct. of tract below federal poverty line	0.0009	(0.001)	-0.0015	(0.002) **
Intercept	-0.4375	0.1633 **	-0.04138	0.1826 **
Level 1 units	1128		712	
Level 2 units	46		41	
AIC	963.1		704.1	
BIC	1019.8		752.2	

*** p<0.001 ** p<0.01 * p<0.05 † p<0.10

Table 1. Results from multilevel models (level 2 = CBSAs) predicting the likelihood of unfavorable chronic health outcomes (a-c), obesity (d), and height (e)

	d. High body mass index (> 30 kg/m^2)			
	Foreign-born Mexicans		U.S.-born Mexicans	
	β	(S.E.)	β	(S.E.)
Male	-0.163	(0.030) **	-0.071	(0.036) **
Age	-0.001	(0.001) **	-0.005	(0.001) **
Age -squared				
Married	-0.061	(0.031) **	0.082	(0.038)
Formal schooling (years)	0.004	(0.003)	-0.010	(0.005) **
Home owner	-0.003	(0.033) **	-0.069	(0.044) **
Employed	-0.032	(0.034) **	0.000	(0.042) *
Family income (REF = Less than $10,000)				
$10,000 to $19,999	0.040	(0.061)	0.170	(0.090)
$20,000 to $34,999	0.110	(0.061)	0.233	(0.091)
$35,000 to $54,999	0.020	(0.070)	0.279	(0.100)
$55,000 to $74,999	0.079	(0.087)	0.217	(0.124)
$75,000 and over	0.166	(0.105)	0.321	(0.132)
Ratio of family income to poverty	-0.025	(0.023) **	-0.016	(0.025) **
Both English and Spanish spoken at home	0.169	(0.104)	0.081	(0.039)
Only Spanish spoken at home	0.187	(0.107)	-0.066	(0.106) **
Duration of stay (months)	0.00089	(0.000)		
Duration of stay - squared	-0.0000008	(0.000)		
Naturalized citizen	0.01436	(0.035)		
<u>Neighborhood characteristics:</u>				
Pct. Latino in buffer	-0.00174	(0.001) **	-0.00099	(0.001) **
Pct. Mexican descent | Latino	-0.00080	(0.001) **	-0.00061	(0.001) **
Pct. naturalized citizen | FB Mexican	0.000	(0.001) **	0.000	(0.001) **
Pct 10+ years in U.S. | FB Mexican	0.000736	(0.001)	0.001532	(0.001)
Pct. speak Spanish at home | Latinos	0.0013	(0.002)	0.0008	(0.002)
Pct. of tract below federal poverty line	0.0065	(0.002)	-0.0011	(0.003) **
Intercept	-0.1217	0.2122 **	0.6497	0.2488
Level 1 units	1151		724	
Level 2 units	48		42	
AIC	1681.4		1139.2	
BIC	1738.2		1189.2	

*** p<0.001 ** p<0.01 * p<0.05 † p<0.10

Table 1. Results from multilevel models (level 2 = CBSAs) predicting the likelihood of unfavorable chronic health outcomes (a-c), obesity (d), and height (e)

	e. Height (z-scores)			
	Foreign-born Mexicans		U.S.-born Mexicans	
	β	(S.E.)	β	(S.E.)
Male	13.066	(0.362)	14.085	(0.447)
Age	-0.135	(0.018) **	-0.121	(0.018) **
Age -squared				
Married	0.192	(0.373)	0.581	(0.476)
Formal schooling (years)	0.186	(0.040)	0.230	(0.068)
Home owner	0.396	(0.399)	0.227	(0.550)
Employed	-0.481	(0.416) **	0.393	(0.522)
Family income (REF = Less than $10,000)				
$10,000 to $19,999	-1.268	(0.735) **	-2.927	(1.115) **
$20,000 to $34,999	-1.608	(0.744) **	-3.130	(1.133) **
$35,000 to $54,999	-2.228	(0.853) **	-4.247	(1.246) **
$55,000 to $74,999	-2.109	(1.073) **	-3.946	(1.548) **
$75,000 and over	-1.876	(1.288) **	-3.820	(1.644) **
Ratio of family income to poverty	0.876	(0.281)	0.763	(0.309)
Both English and Spanish spoken at home	0.951	(1.255)	-0.085	(0.489) **
Only Spanish spoken at home	0.344	(1.291)	0.136	(1.346)
Duration of stay (months)	0.00404	(0.003)		
Duration of stay - squared	-0.0000033	(0.000) **		
Naturalized citizen	0.18240	(0.419)		
<u>Neighborhood characteristics:</u>				
Pct. Latino in buffer	0.00453	(0.012)	-0.02102	(0.014) **
Pct. Mexican descent | Latino	0.02908	(0.012)	0.01439	(0.016)
Pct. naturalized citizen | FB Mexican	-0.002	(0.013) **	-0.002	(0.016) **
Pct 10+ years in U.S. | FB Mexican	-0.000190	(0.008) **	-0.014930	(0.016) **
Pct. speak Spanish at home | Latinos	-0.0080	(0.020) **	-0.0144	(0.020) **
Pct. of tract below federal poverty line	0.0092	(0.027)	-0.0412	(0.031) **
Intercept	156.35	2.7679	164.2	2.9286
Level 1 units	1152		725	
Level 2 units	48		42	
AIC	7805.3		5150.9	
BIC	7863.9		5199	

*** p<0.001 ** p<0.01 * p<0.05 † p<0.10